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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/511,604 | 11/03/2004 | Christian Walsdorff | 260781US0PCT | 5703 |

22850 7590 09/23/2005

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EXAMINER

NGUYEN, NGOC YEN M

ART UNIT PAPER NUMBER

1754

DATE MAILED: 09/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/511,604

Applicant(s)

WALSDORFF ET AL.

Examiner

Ngoc-Yen M. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-6, 8-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Walsdorff et al (US 2004/0052718).

Walsdorff '718 discloses a process for preparing chlorine by catalytic gas-phase oxidation of hydrogen chloride over a fixed catalyst bed (note claim 1). The conversion of hydrogen chloride in a single pass can be limited to from 15 to 95%, preferably from 40 to 90% (note paragraph [0030]). The value of 40% is within the claimed ranges.

Unreacted hydrogen chloride can be separated off and partly or wholly returned to the catalytic hydrogen chloride oxidation (note paragraph [0030]).

Suitable catalysts comprise ruthenium oxide, ruthenium chloride or other ruthenium compounds on silicon dioxide, aluminum oxide, titanium oxide or zirconium oxide as support (note paragraph [0020]).

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Walsdorff '718 further discloses that 2-10 reactors in series can be used and the oxygen can either all be introduced together with the hydrogen chloride upstream of the first reactor or can be added at points distributed over the various reactors (note [0023]).

The process of Walsdorff '718 anticipates the claimed process.

Claims 1-5, 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Johnson et al (2,542,961).

Johnson '961 discloses a process for producing chlorine by contacting oxygen and hydrogen chloride with a chloride of a metal having an atomic number of from 21 to 30 (note claim 1).

As disclosed in Example 1, a mixture of oxygen and anhydrous hydrogen chloride is contacted with a fluidized catalyst consisting of alumina impregnated with copper chloride. 53% of the anhydrous hydrogen chloride thus charged to the reactor is recycled from within the system. 58% of the hydrogen chloride charged to the reactor is converted to chlorine per pass (note column 7, lines 55-75). The value of "58%" is well within the claimed ranges for the conversion of hydrogen chloride.

Johnson '961 further discloses that two or more reactors, connected in series or parallel flow may be employed (note column 4, lines 10-20).

The process of Johnson '961 anticipates the claimed process.

Claims 1-5, 8-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Benson et al (5,639,436).

Benson discloses a process for recovering chlorine from a stream of hydrogen chloride, which comprises the steps:

a) providing at least two reactors, including an oxidation reactor and a chlorinator reactor, and providing fluidized beds of a carrier catalyst containing cupric oxide and cupric chloride in reaction zones within the reactors;

b) supplying a stream of hydrogen chloride and oxygen to each reactor

c) the stream reacting in the chlorinator reactor with the fluidized bed of carrier catalyst to convert part of the cupric oxide to cupric chloride, and cupric hydroxychloride, thereby essentially eliminating the hydrogen chloride to produce a product stream including chlorine, oxygen, inerts and water, which is removed from the chlorinator reactor, and

d) passing a stream of fluidized carrier catalyst containing cupric chloride, cupric hydroxychloride, and residual cupric oxide from the chlorinator reactor, to be supplied to the combination reactor in a bed operating at temperatures between about 300 and 400°C, wherein the combination reactor is supplied with a stream of hydrogen chloride and oxygen to fluidize the bed, and for exothermic reaction with cupric chloride and cupric hydroxychloride to produce cupric oxide and an overhead stream of chlorine, unrecovered hydrogen chloride, inerts, water, and residual oxygen,

e) feeding the carrier catalyst stream containing cupric oxide to the chlorinator reactor for reaction with hydrogen chloride, as defined in c), and

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f) supplying the overhead stream of chlorine, hydrogen chloride, inerts, water and oxygen from the combination reactor to the chlorinator to cause hydrogen chloride therein to react with the cupric oxide in the carrier catalyst,

g) the product stream from the chlorinator reactor being chlorine rich but substantially free of hydrogen chloride (note claim 1).

Benson '436 teaches that for the reactor which is operating at 360 to 400°C, the hydrogen chloride is partially converted, as limited by chemical equilibrium, 40% to 70% by weight of to chlorine, as is well known for the well-documented Deacon process (note column 5, lines 25-31).

Step f) fairly teaches that at least a portion of the hydrogen chloride is recycled.

The process of Benson '436 anticipates the claimed process.

Claims 1, 3-6 are rejected under 35 U.S.C. 102(b) as being anticipated by GB 1,046,313.

GB '313 discloses a process for producing chlorine by oxidizing hydrogen chloride in the presence of a ruthenium catalyst. From the table on page 2, the % conversion varies from 40-79%.

The process of GB '313 anticipates the claimed process.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walsdorff '718.

Walsdorff '718 discloses a process as stated above.

For the conversion values beside those that would anticipate the claimed ranges, the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time of invention to select the portion of the prior art's range which is within the range of the applicants' claims because it has been held prima facie case of obviousness to select a value in a known range by optimization for the results. *In re Boesch*, 205 USPQ 215. Additionally, the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness. *In re Malagari*, 182 USPQ.

For claim 7, even though Walsdorff '718 does not disclose that the proportion of recirculated hydrogen chloride is gradually increased during the time of operation of the catalyst, however, since Walsdorff '718 teach a portion or all of the unreacted hydrogen chloride can be recycled, it would have been obvious to one of ordinary skill in the art to optimize the amount of the recycled HCl throughout the process of producing chlorine by oxidizing hydrogen chloride in order to maximize yield and/or efficiency.

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Claims 1-5, 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson '961.

Johnson '961 discloses a process as mentioned in the above rejection.

For value other than "58%" for the HCl conversion, for the proportion of recirculated HCl and for the points of introduction of the oxygen, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize these process conditions in Johnson '961 through routine experimentation in order to obtain the best results.

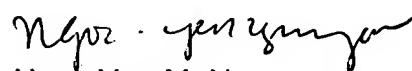
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner is currently on Part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Stan Silverman can be reached on (571) 272-1358. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed (571) 272-1700.



Ngoc-Yen M. Nguyen
Primary Examiner
Art Unit 1754

nmn

September 18, 2005